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# **The State of Supply Chain Management Practices within SMEs in Ghana: A Case Study of Selected Agrochemical Companies in Kumasi**

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# THE STATE OF SUPPLY CHAIN MANAGEMENT PRACTICES WITHIN SME's IN GHANA: A CASE STUDY OF SELECTED AGROCHEMICAL COMPANIES KUMASI

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**Abstract :** *The study seeks to find out the state of supply chain management within SME's in Ghana by investigating the extent of Supply Chain Management (SCM) practices, its benefits and challenges using some selected agrochemical companies in the Kumasi Metropolis. The study was a descriptive study. Primary data was obtained from the selected respondents using postal questionnaires. Convenience sampling technique was employed to obtain information from both the management staff and the consumers (farmers). Two hundred and fifty (250) questionnaires were distributed to the respondents. However, a total number of 200 could be retrieved for discussion and analysis. The obtained data was then analysed by the usage of descriptive method which employed tools like charts and tables. The study revealed that foreign and domestic suppliers, distributors and consumers together with Agrochemical Companies forms the supply chain; and an indication of weak supply chain management practices within the supply chain of Agrochemical companies. The study however was limited by difficulty in obtaining data and respondents' unwillingness to give information can affect reliability of the study. However, all academicians and practitioners who are active in SCM will find value in this research.*

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**Keywords-** *Supply Chain Management (SCM), SMEs, Agrochemical Companies and Logistic Management*

## 1. INTRODUCTION

The supply chain is a network of autonomous or semiautonomous business entities involved, through upstream and downstream links, in different business processes and activities that produce physical goods or services to customers. It consists of a series of activities that an organisation uses to deliver value, either in the form of a product, service, or a combination of both, to its customers (Lin and Shaw, 1998). Furthermore, the supply chain could be considered as an integration of materials and information flow between customer, manufacturer and supplier.

Recent economic trends have de-emphasised the benefits of vertical integration (e.g. economies of scale, access to capital, and large physical infrastructure investment) and instead have focused on the benefits of being specialised (e.g. speed, agility, and rapid growth). These trends have forced even large organisations to rely on hundreds or even thousands of external firms or suppliers to deliver value to the marketplace. As this shift has taken place, the importance of managing and coordinating the activities between these disparate entities has become paramount. Such effort is often referred to as “supply chain management” (Archibald, *et al.*, 1999). The supply chain process involves a number of sub-processes which include: sales and operation planning; demand management; customer order management; production planning; control and execution; materials, quality and inventory

management; material procurement; distribution requirements planning; transportation and shipment management; and integrated supply and demand plan. The aim of supply chain management is to achieve a balance between the goals of high quality customer service and low inventory and unit cost. To further emphasize the importance of SCM, supply chain strategies are the critical backbone to business organizations today. Effective market coverage, availability of products at locations which hold the key to revenue recognition depends upon the effectiveness of supply chain strategy rolled out. Very simply stated, when a product is introduced in the market and advertised, the entire market in the country and all the sales counters need to have the product where the customer is able to buy and take delivery. Any 'glitch' in product not being available at the right time can result in drop in customer interest and demand which can be disastrous. Transportation network design and management assume importance to support sales and marketing strategy.

Inventory control and inventory visibility are two very critical elements in any operations for these are the cost drivers and directly impact on the bottom lines in the balance sheet. Inventory means value and is an asset of the company. Every business has a standard for inventory turnaround that is optimum for the business. Inventory turnaround refers to the number of times the inventory is sold and replaced in a period of twelve months. The health of the inventory turn relates to the health of business.

In a global scenario, the finished goods inventory is held at many locations and distribution centers, managed by third parties. A lot of inventory would also be in the pipeline in transportation, besides the inventory with distributors and retail stocking points. Since any loss of inventory anywhere in the supply chain would result in loss of value, effective control of inventory and visibility of inventory gains importance as a key factor of supply chain management function.

A careful analysis of the processes in a supply chain would reveal that there are a large number of components involved, including suppliers and customers. Managing these components would be more challenging than ever before. Therefore, SCM represents an evolutionary step beyond logistics. It is therefore often argued that it is necessary to improve the planning and management of complex interrelated systems such as materials planning, inventory management, capacity planning and production management within the chain. Successful SCM requires an integration of all the components involved into a combination of business processes within and across organizations. This requires integration of the organizational elements responsible for each activity and the external suppliers and customers who are part of the planning and execution process. The goals are to achieve speed-to-market, agility, and flexibility to respond more quickly to actual customer demand, while keeping cost at a minimum. In order to make the goals, it is necessary to integrate the processes at the operational level. All components involved in any supply chain need to be managed properly for effective and efficient operations. Integration of those components within and outside organizations would result in a number of complexities. Many significant studies with respect to this subject have identified significant barriers in the supplier integration within the construction sector. These barriers could result in a number of complexities such as the existence of supply networks, links between components, precedence and interdependencies between components.

However, recent studies reported in the developments on business processes and integration of components in supply chain environment have been focused mainly on integration of components at the database level and/or interfaced processes within individual departments rather than at the structural level. This therefore brings to light the various supply chain management practices used in the business cycle. These are distribution network configuration which involves number, location and network missions of suppliers, production facilities, distribution centers, warehouses, cross-docks and customers; distribution strategy; trade-offs in logistical activities which ensures that both distribution network configuration and strategy are well coordinated in order to achieve the lowest total logistics cost. They also involve information, inventory management and cash flow activities.

The relative importance of small and medium scale enterprise in advanced and developing countries has led and would continue to lead to a reconsideration of the role of small and medium scale enterprises in the economy of nations. The development of many countries is often measured by such indices as the level of industrialization, modernization, urbanization, gainful and meaningful employment for all those who are able and willing to work, income per capital, equitable distribution of income, and the welfare and quality of life enjoyed by the citizenry. There is no doubt that small scale enterprises exist in most economic environments. The major advantage of the sector is its employment potential at low capital cost. The labour intensity of the SME sector is much higher than that of the large enterprises. The role of small and medium enterprises in the economic and social development of the country is well established. The sector is a nursery of entrepreneurship, often driven by individual creativity and innovation. As the engine of growth, SMEs in Ghana can be viewed as rural and urban enterprises. For urban enterprises, organization is either planned or unplanned. The planned-urban enterprises are characterized by paid employees with registered offices whereas unplanned-urban enterprises are mostly confined to the home, open space, temporary wooden structures etc. Industrial activities commonly found in this set-up include: soap and detergent making, agro-processing, tailoring, blacksmithing, mechanics, textile and leather making, food processing, electronic assembling, bakery and furniture making.

Supply chain management is a complex responsibility which is very essential for the growth of the SMEs in Ghana. There are supply chains within supply chain. Supply chains are not linear from one customer to one supplier. They involve multiple customers and multiple suppliers each of whom has a supply chain. Compound that with presence of three different supply chains-product, information and financial. This conundrum applies to companies regardless of size, regardless of industry and regardless of what country the businesses are located.

## **1.2. Objectives of the Study**

The main objective of the study is to gain an understating of supply chain, its management, practices and incorporation into the operations of SME's in Ghana.

The specific objectives are;

- To map up the supply chain of Agro Chemicals Companies in Kumasi.
- To find out the extent of practice of supply chain management in the operations of Agro Chemicals Companies in Kumasi.
- To discover the factors inhibiting the practice of supply chain management in Agro Chemicals Companies Kumasi.
- To identify the benefits that would accrue to Agro Chemicals Companies in practicing supply chain management.

### 1.3. Research Questions

The pertinent questions guiding the research are as follows:

- What are the supply chain linkages of Agro Chemicals Companies in Kumasi?
- To what extent does Agro Chemicals Companies in Kumasi practice supply chain management in their operations?
- What factors inhibit the practice of supply chain management in Agro Chemicals Companies in Kumasi?
- What benefits are likely to accrue to Agro Chemicals Companies in Kumasi in the practice of supply chain management?

## 2.0 LITERATURE REVIEW

### 2.1. Overview of SME's

World over, small and medium enterprises (SMEs) sector has acquired a significant and pivotal position in the entire development process (Narain, n.d.). Small and medium enterprises sometimes also called small and medium sized enterprises (SMEs) are considered important drivers of innovation and change in Europe. Nonetheless, it is not always clear what is an SME and what is not (Gattiker, 2008). According to Hari Srinivas (2005), SMEs are defined by three keywords - small, single and local:

- **Small** - SMEs are small in nature - either in terms of number of (a) employees - 10 persons for 'small' to 200 persons for 'medium', depending on the country's laws, (b) capital and assets - limited working capital and assets and (c) turnover - the overall turnover of the enterprise is small, compared to larger businesses.
- **Single** - Most SMEs have a single owner who could also be the sole employee. While this may predominantly be the case, definitions set 250 to 500 employees as the limit for enterprises to be called an SME. The 'single' also refers to single products produced or service provided.
- **Local** - SMEs are essentially local in nature - their market is usually localized to the area where they are located (same city, district or state); or may be 'local' in the sense that they operate from a place of residence - also called SOHO [Small Office Home Office]

While a broad generic definition can be taken for SMEs, some countries have a very specific definition for what types of enterprises can be called and SME'. The European Union categorizes companies with fewer than 10 employees as 'micro', those with fewer than 50 employees as 'small', and those with fewer than 250 as 'medium'. By contrast, in the United States, when small business is defined by the number of employees, it often refers to those with fewer than 100 employees, while medium-sized business often refers to those with fewer than 500 employees. Canada defines a small business as one that has fewer than 100 employees (if the business is a goods-producing business) or fewer than 50 employees (if the business is a service-based business), and a medium-sized business as fewer than 500. New Zealand however considers an SME to be 19 people or fewer (Wikipedia encyclopedia) and Zimbabwe describes it as a business employing not more than 50 people with assets of less than Z\$3.0 million. Medium enterprises for manufacturing are those employing up to 100 people and with an asset base of Z\$12 million. For other sectors, medium enterprises employ up to 75 people, with an asset base of Z\$7 million (Ngwenya, *et al.*, 2003 as cited in Singh, *et al.*, 2005).

There is growing recognition of the important role small and medium enterprises (SMEs) play in economic development. They are often described as efficient and prolific job creators, the seeds of big businesses and the fuel of national economic engines. Even in the developed industrial economies, it is the SME sector rather than the multinationals that is the largest employer of workers (Mullineux, 1997). Interest in the role of SMEs in the development process continues to be in the forefront of policy debates in most countries. Governments at all levels have undertaken initiatives to promote the growth of SMEs (Abor and Quartey, 2010). SME development can encourage the process of both inter and intra-regional decentralization; and, they may well become a countervailing force against the economic power of larger enterprises. More generally, the development of SMEs is seen as accelerating the achievement of wider economic and socio-economic objectives, including poverty alleviation (Cook and Nixon, 2000).

On the other end of the continent, they turn to have similar impacts on the economy of their respective countries as it has been portrayed in the African countries. Small enterprises play a significant role in the Brazilian economy. In 2000, micro and small enterprises accounted for 20% of Brazilian national GDP, 96% of all enterprises and 53% of the overall workforce. In Mexico, they are integral as in 1994 they comprised 98.7% of all business enterprises, 77.7% of total employment and 43.3% of total sales (Singh, *et al.*, 2005). They represent 99% of an estimated 23 million enterprises in the EU and provide around 75 million jobs representing two-thirds of all employment. SMEs contribute up to 80% of employment in some industrial sectors, such as textiles, construction or furniture (Gattiker, 2008) and in the U.S. they constitute 99.7% of businesses employing over 80% of workforce (Tukel, 2010). The sector is seen playing a pivotal role in the overall industrial economy of India. It is estimated that in terms of value, the sector accounts for about 39% of the manufacturing output and around 33% of the total export of the country. Further, in recent years the SME sector has consistently registered higher growth rate compared to the overall industrial sector (Wikipedia encyclopedia).

## 2.2. SME's in Ghana

Small scale enterprises have been variously defined, but the most commonly used criterion is the number of employees of the enterprise. In applying this definition, confusion often arises in respect of the arbitrariness and cut off points used by the various official sources. As contained in its Industrial Statistics, The Ghana Statistical Service (GSS) considers firms with less than 10 employees as small scale enterprises and their counterparts with more than 10 employees as medium and large-sized enterprises. Ironically, the GSS in its national accounts considered companies with up to 9 employees as small and medium enterprises. An alternate criterion used in defining small and medium enterprises is the value of fixed assets in the organization. However, the National Board of Small Scale Industries (NBSSI) in Ghana applies both the fixed asset and number of employees' criteria. It defines a Small Scale Enterprise as one with not more than 9 workers, has plant and machinery (excluding land, buildings and vehicles) not exceeding 10 million Cedis (Kayanula and Quartey, 2000).

Mensah (2004) also in a presentation at the UNIDO Regional Workshop of Financing Small and Medium Scale Enterprises identified SMEs as the catalyst for the economic growth of the country as they are a major source of income and employment. He further defines this group to include Micro enterprises, thus those employing up to 5 employees with fixed assets not exceeding the value of \$10,000; Small enterprises employing between 6 and 29 employees with fixed assets of \$100,000 and medium enterprises employing between 30 and 99 employees with fixed assets of up to \$1 million. From the above, though there is no one particular definition for SMEs in Ghana, their diverse contributions to growth and development of the country cannot be downplayed. SMEs represent about 92% of Ghanaian businesses and contribute about 70% to Ghana's GDP and over 80% to employment (Abor and Quartey, 2010).

SMEs in Ghana can be categorized into urban and rural enterprises. The former can be subdivided into 'organized' and 'unorganized' enterprises. The organized ones tend to have paid employees with a registered office whereas the unorganized category is mainly made up of artisans who work in open spaces, temporary wooden structures, or at home and employ little or, in some cases, no salaried workers. They rely mostly on family members or apprentices. Rural enterprises are largely made up of family groups, individual artisans, women engaged in food production from local crops. The major activities within this sector include soap and detergents, fabrics, clothing and tailoring, textile and leather, village blacksmiths, tin-smithing, ceramics, timber and mining, bricks and cement, beverages, food processing, bakeries, wood furniture, electronic assembly, agro processing, chemical based products and mechanics (Liedholm & Mead, 1987; Osei, *et al*, 1993, World Bank, 1992; Gray, Cooley & Lutablewa, 1997). It is interesting to note that small scale enterprises make better use of scarce resources than large scale enterprises.

Like many SMEs across the world, Ghana's SMEs suffer from a lack of financial capital. This stems from the fact that SMEs have limited access to capital markets, both locally and internationally, due to the perception of higher risk, informational barriers and the higher costs of intermediation for smaller firms. As a result, SMEs often cannot obtain long-term financing in the form of debt and equity. SMEs also have difficulties in gaining access to appropriate technologies and information on available techniques. Other constraints on

capital and labor, as well as uncertainty surrounding new technologies, restrict incentives to innovation (Singh, *et al*, 2005).

### 2.3. Supply Chain

Supply chain is a sequence of events intended to satisfy a customer and it includes procurement, manufacture, distribution and waste disposal, together with associated transportation, storage and information technology. It has also been explained not to include only manufacturers and suppliers, but also transporters, warehouses, retailers, and even customers themselves (Chopra and Meindl, 1999). They further assert that within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and customer request. These functions include but not limited to, new product development, marketing, operations, distributions, finance, and customer service. A supply chain is that network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer (Opore, *et al*, Blanchard, 2010) stress that a supply chain is a series of activities that people have engaged in since the dawn of commerce, he further sums the various sequence of events to cover a product's entire life cycle thus from conception to consumption. To elaborate further, it has also been defined as a network of entities through which material flows (Lummus and Alber, 1997). Those entities may include suppliers, carriers, manufacturing sites, distribution centers, retailers, and customers. From these definitions, a supply chain can be said to be a network of organizations that work hand in hand to ensure that the customer needs are met in a judicious manner thus the organizations in the network cutting down on cost, maximizing profit and at the same time satisfying the customer needs.

In today's tough economy, the competition among large corporations has long been extended to the competition among players in supply chains (Xia and Tang, 2011). The scope of the supply chain can be defined in terms of the number of firms involved in the supply chain and the activities and functions involved. The original scope of the supply chain has been across firms, although some firms start by integrating within their organizations before expanding to other firms (Cooper, *et al*, 1997). How much of this supply chain needs to be managed depend on several factors, such as the complexity of the product, the number of available suppliers, and the availability of raw materials. Dimensions to consider include the length of the supply chain and the number of suppliers and consumers at each level (*ibid*).

Building and maintaining an end-to-end supply chain organization takes money, but it also takes time, talent, energy, focus, commitment from senior management, and a lot of guts to pull it off successfully. However, those are the qualities that the best-run companies in the world share, and it is why they are on top (Blanchard, 2010). Top-performing supply chains share seven characteristics (*ibid*):

1. They have a clear supply chain strategy as their foundation.
2. They are adaptable and quick, which allows them to compete in today's dynamic environment.
3. They are transparent, have clearly stated performance expectations, and have a culture of accountability to their customers.



4. They are focused on continuous improvement throughout the supply chain and aim at peak-to-peak performance.
5. They know their strengths and their weaknesses, and participate in benchmarking activities.
6. They have an end-to-end perspective, focusing on the supply chain activities of plan-buy make-move-store-sell.
7. They have a global, rather than regional, focus.

## **2.4. Supply Chain Management**

Firms can no longer effectively compete in isolation of their suppliers and other entities in the supply chain. Interest in the concept of supply chain management has steadily increased since the 1980s when companies saw the benefits of collaborative relationships within and beyond their own organization (Lummus and Vokurka, 1999). As competition in the 1990s intensified and markets became global, so did the challenges associated with getting a product and service to the right place at the right time at the lowest cost. Organizations began to realize that it is not enough to improve efficiencies within an organization, but their whole supply chain has to be made competitive. The understanding and practicing of supply chain management (SCM) has become an essential prerequisite for staying competitive in the global race and for enhancing profitability (Lia, *et al*, 2006).

Supply chain management (SCM) is defined by the Council of Logistics Management (CLM) as the systemic, strategic coordination of the traditional business functions and tactics across these businesses functions within a particular organization and across businesses within the supply chain for the purposes of improving the long-term performance of the individual organizations and the supply chain as a whole. SCM has been defined to explicitly recognize the strategic nature of coordination between trading partners and to explain the dual purpose of SCM: to improve the performance of an individual organization, and to improve the performance of the whole supply chain. Sock and Lambert (2001) however are of the views that SCM involves the management of eight key business processes encompassing customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, procurement, product development and commercialization and returns. The goal of SCM is to integrate both information and material flows seamlessly across the supply chain as an effective competitive weapon (Lia, *et al*, 2006). The Council of Supply Chain Management Professionals (CSCMP) is a bit more descriptive with its definition. To them it encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. That includes coordinating and collaborating with channel partners, including suppliers, intermediaries, third parties, and customers (Blanchard, 2010). The Council of Supply Chain Management Professionals (CSCMP), an organization that develops industry benchmarks and metrics summarizes the concept of supply chain management in just five words: plan, source, make, deliver, and return. While it is difficult to find a consensus in any field, let alone a field that intersects with so many disparate disciplines, that five-word definition has been accepted as the basic description of what a supply chain looks like and what its core functions are (*ibid*).

The primary objective of supply chain management is to fulfill customer demands through the most efficient use of resources, including distribution capacity, inventory and labor. In theory, a supply chain seeks to match demand with supply and do so with the minimal inventory. Various aspects of optimizing the supply chain include liaising with suppliers to eliminate bottlenecks; sourcing strategically to strike a balance between lowest material cost and transportation, implementing JIT (Just In Time) techniques to optimize manufacturing flow; maintaining the right mix and location of factories and warehouses to serve customer markets, and using location/allocation, vehicle routing analysis, dynamic programming and, of course, traditional logistics optimization to maximize the efficiency of the distribution side (Wikipedia encyclopedia). In the short term SCM seeks to increase productivity and reduce inventory and cycle times whilst the long term strategy is to improve process efficiency and effectiveness for all the members to eventually increase customer satisfaction, market share, and profits (Tukel, 2010).

Previously, SCM was typically a reactive mode of management seeking to insulate the business from the risks of supply chain disruptions, especially from major suppliers immediately upstream, primarily engaged with the assessment of buffer stocks to minimize the undesirable consequences of such disruptions. SCM today demands a much more proactive, strategic and corporate approach, engaging with the other organizations throughout the supply chain in seeking to gain sustainable competitive advantage and profitability through leaner, more agile, efficient, resilient, comprehensive and customer-focused strategies. Effective SCM is concerned with the interchange of information, communications and relationship development, potentially throughout the entire supply chain, upstream to the raw material supply sources and downstream to the end consumer of the goods and services (Christopher and Towill, 2002).

Supply chain management has become common practice across industries since it addresses long-term strategic alliance, supplier-buyer partnerships, cross-organizational logistics management, joint planning, control of inventory, and information sharing. Effective supply chain management will lead to a lowering of the total amount of resources required to provide the necessary level of customer service to a specific segment and improving customer service through increased product availability and reduced order cycle time (Banomyong and Supatn, 2011). It is probably easier to understand why executives would want to manage their supply chains to the point-of-consumption because whoever has the relationship with the end user has the power in the supply chain (Stock and Lambert, 2001).

## **2.5. Supply Chain Management Practices**

SCM practices have been defined as a set of activities undertaken in an organization to promote effective management of its supply chain. There are seven elements of supply chain practice such as agreed vision and goals, information sharing, risk and award sharing, cooperation, process integration, long-term relationship and agreed supply chain leadership (Min & Mentzer, 2004). Donlon (1996) in his view describes supply chain practice to include supplier partnership, outsourcing, cycle time compression, continuous process flow and information sharing. The dimension of purchasing, quality, and customer relations is however added (Tan *et al.* 1998). They further bring to bear six elements of supply chain practice (using factor analysis) to include supply chain integration, information sharing,

supply chain characteristics, customer service management, geographical proximity and JIT capability.

Alvarado and Kotzab (2001) include in their list of SCM practices concentration on core competencies, use of inter-organizational systems such as EDI, and elimination of excess inventory levels by postponing customization toward the end of the supply chain. Consequently the literature portrays SCM practices from a variety of different perspectives with a common goal of ultimately improving organizational performance.

### **2.5.1. Logistics Management as a Supply Chain Management Practice**

In today's fast paced economic climate, many firms increasingly realize that globalization has made the world smaller and more competitive. A change in one place impacts another quickly. Also, customers seek products that can respond well to their specific needs. As such, firms are now looking at securing cost, quality, technological and other competitive advantages as a strategy to pursue in a globally competitive environment. One currently popular competitive advantage for firms is to promote and provide value to its customers by performing its supply chain activities more efficiently than competition. As a result, one area of increasing focus is on the logistical management of a firm's set of operations (Goh and Pinaikul, 1998). Logistics management can be viewed as the detailed process of planning, implementing and controlling the efficient, cost-effective flow and storage of materials and products, and related information within a supply chain to satisfy demand (Christopher, 1993). Effective logistics management provides a major source of competitive advantage if it can control cost and enhance service differentiation. This unique role will help firms become both cost and value leaders. Thus, good logistics management is increasingly recognized as the key enabler, which allows a company to gain and maintain its competitive advantage and ensure maximum customer satisfaction (*ibid*).

### **2.5.2. Inventory Management as a Supply Chain Management Practice**

Inventories are stock of items kept to meet future demand (Russell and Taylor, 2006). According to the management study guide, inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet. Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid over or under inventory that can impact the financial figures. Inventory is always dynamic. Inventory management requires constant and careful evaluation of external and internal factors and control through planning and review. Most of the organizations have a separate department or job function called inventory planners who continuously monitor, control and review inventory and interface with production, procurement and finance departments. A supply chain management approach to inventory involves channel-wide management of inventories. This approach does not necessarily seek to eliminate most of the inventory from the channel, such as zero inventory or just-in-time systems, but only the redundant inventories in the system (Cooper and Ellram, 1993).

### 2.5.3. Purchasing and Distribution as a Supply Chain Management Practice

The purchasing department should be managed as a strategic supply chain center rather than as merely a place to beat down costs. An effective way to stay on the same page as your suppliers is to share transactional information with them. Simplifying your product line can lead to a more efficient supply chain flow. Purchasing materials through an online exchange can result in significant cost savings, if due diligence is done first. While not necessarily used interchangeably, the terms procurement, purchasing, and sourcing all describe one of the main supply chain management processes. As Paquette, author of *The Sourcing Solution*, describes it, the role of sourcing is “to locate the one company out there that can provide needed product better than anyone else” (Paquette, 2004). In *Essentials of Supply Chain Management*, the author, Hugos gets right to the point when he notes that, by tradition, the main activities of a purchasing manager are “to beat up potential suppliers on price and then buy products from the lowest cost supplier that [can] be found” (Blanchard, 2010).

When companies fail to recognize the positive impact good procurement practices can have on their bottom line, it makes it that much more difficult for significant and enduring supply chain improvements to take effect (Nelson, *et al*, 2005). Fortunately, word has gotten out that by collaborating with your key supply chain partners, rather than relying on the traditional supplier squeeze and taking a we-know-better-what-they-want-than-they-do attitude toward customers, the purchasing department can become a strategic corporate advantage rather than merely a necessary evil (*ibid*).

Distribution on the other hand according to Stock and Lambert (2001) refers to the steps taken to move and store a product from the supplier stage to a customer stage in the supply chain. They further enunciate that it occurs between every pair of stages in the supply chain and describes it as the key driver of overall profitability of a firm since it affects both cost and the customer experience directly.

As the pace of commerce has dramatically increased, the patience of customers has similarly decreased. “Better, faster, and cheaper” just isn’t good enough anymore; customers today are demanding perfect orders, shipped on time to the minute, at a cost that barely leaves any margin for error or profit. A best-in-class distribution network delivers on customer demands while keeping costs in line. It takes collaboration across the entire supply chain to design the optimum distribution network to bring a product to market. The ultimate goal of a distribution network plan is a supply chain properly balanced between inventory, transportation, and manufacturing. On-time delivery is a fundamental premise behind supply chain management, and it is a key benchmark on the road to achieving the perfect order. Although same-day delivery is available from many logistics providers, any company relying on the fastest and most expensive transportation options to fulfill its delivery obligations is not going to be in business very long. The old adage “Build a better mousetrap and the world will beat a path to your door” is now hopelessly out of date. It is no longer good enough to build that better mousetrap but also have to build a better distribution network from which you can optimally service your customers (*ibid*).

A distribution network plan, Harmelink in Blanchard (2010) suggests, should answer these nine questions:

1. How many distribution centers (DCs) do you need?
2. Where should the DCs be located?

3. How much inventory should be stocked at each DC?
4. Which customers should be serviced by each DC?
5. How should customers order from the DC?
6. How should the DCs order from suppliers?
7. How often should shipments be made to each customer?
8. What should the service levels be?
9. Which transportation methods should be used?

#### **2.5.4. Linking Supply Chain to the Business Strategy**

The supply chain improvements described indicate that supply chain management has the potential to improve a firm's competitiveness. Supply chain capability is as important to a company's overall strategy as overall product strategy. Supply chain management encourages management of processes across departments. By linking supply chain objectives to company strategy, decisions can be made between competing demands on the supply chain. Improvements in performance are driven by externally-based targets rather than by internal department objectives. Managing the supply chain means managing across traditional functional areas in the company and managing interactions external to the company with both suppliers and customers. This cross-boundary nature of management supports incorporating supply chain goals and capabilities in the strategic plan of the company. This focus on integration can then lead to using the supply chain to obtain a sustainable competitive advantage over competitors. The impact of managing overall product demand and the supply of product will impact the profitability of the company. The supply chain strategy can be viewed as the pattern of decisions related to sourcing product, capacity planning, conversion of finished product, deployment of finished product, demand management and communication, and delivery. Linking supply chain strategy to the business strategy involves defining the key business processes involved in producing a company's product or service (Lummus and Vokurka, 1999).

#### **2.5.5. SCM Strategic and Operational Success Factors**

Building customer-supplier relationships SCM is the securing, coordinating and maintaining of formal links with all parties that perform a vital function. In order to do this, one needs first to develop a SCM process map describing the activities of all members involved in the supply chain and the relationships among them in successfully achieving the SCM goals and objectives. Information and communication technologies changed the way firms conduct transactions, particularly in understanding and restructuring relationships. These relationships include business-to-business (B2B), business-to-consumer (B2C), consumer-to-business (C2B), and consumer-to-consumer (C2C).

Relationship creation and maintenance helps to breed future success. Communicating benefits of relationships, clarifying customer needs and expectations, assisting in problem solving and conflict resolution, improving performance measures with suppliers, and creating competitive advantage help to maintain effective relationships (Stuart and McCutcheon, 2000; Lester, 2000; Vokurka, 1998). How effectively a firm develops its supply chain depends on how it understand these relationships and builds partnerships with all relevant

supply chain members. Developing partnerships is one of the most important steps in building and maintaining customer-supplier relationships. Supply chain initiatives that seek to incorporate all suppliers as strategic partners, should first examine which suppliers hold especially strategic significance. Developing partnerships requires considerable resources and may involve significant risks (Stuart and McCutcheon, 2000). When supply chain initiates collaborative relationships, firms have to address all concerns of the areas that will be affected. Both internal and external functional areas must work to build awareness of mutual needs and the importance of SCM to all channel members. Beyond developing awareness, a firm must create goals that can be shared with all strategic partners (Carter, *et al*, 2000). Possible partners need to hold strategic objectives that are compatible with the strategies of the firm pursuing supply chain management. For SCM to work well, company goals must be directed at maximizing the long-term performance of each partner in the supply chain (Crist, 1998). Collaborative relationships have numerous benefits; one is that it is more attractive than going it alone. However, collaboration is challenging and will test the boundaries of present relationships (Handfield and Nichols, 1999).

Groves and Valsamakis (1999) discuss the different degrees of relationships that can exist between suppliers and customers. These relationships can be conceptualized as if on a continuum from adversarial (arm's length) to a full partnership. Adopting a system of partnerships is consistent with SCM theory. An adversarial relationship has little coordination between operations; for example, most purchasing decisions are based on price only and this type of relationship has a short-term focus. A full partnership requires sharing of risks, benefits, and continuous improvement assessment efforts. Partnerships can either be based on single or multi-sourcing. Single sourcing requires a great deal of dependence as well as trust. Few companies are able to develop the required relationships based on real trust with a supplier (Tait, 1998). Suppliers need to be convinced that they will not be taken advantage of in this arrangement. Establishing a dependable and long-term focus on relationships gives firms the ability to monitor, improve or eliminate poor performing suppliers. A supply chain's long term focus along with close communication with customers and suppliers is critical to financial success (Tan, *et al*, 1998). Building trust requires time and consistent performance of channel members.

Establishing a flow of communication is also critical for building partnerships. In a partnership, organizations often communicate through multifunctional teams. These teams are able to provide not only cost information, but also demand and forecast information; which allows companies an opportunity to establish a competitive advantage through mutually beneficial efforts. By not constraining information, organizations are able to communicate more accurately about their abilities to meet costs, deadlines and logistics, which in turn provide a greater opportunity to manage the flow of materials and lower inventory levels across the supply chain.

The knowledge and information that is shared can replace much of the guesswork and lead to greater efficiencies (Harrington, 1997). As pointed by Cooper and Ellram (1993) it is not necessary that all channel members have access to the same information, only that information which is needed for them to better manage their supply chain linkages.

Benefits realized through the integration of cross-functional teams can enhance not only communication flow but also effective product development. Maintaining effective operations has been strongly correlated to an organization's ability to communicate between functional areas both internally and externally (McGinnis and Vallopra, 1999). When sharing information with a supplier or buyer, there is the need for trust in the competence of the partner. Whipple and Frankel (2000) found through investigating best in class relationships, that when either partner had a problem, their partner was jointly committed to finding solutions and alternatives. Companies have to find integrated means of working closely together channel wide that are complementary to partners (Cooper and Ellram, 1993). Thus enjoining problem solving and conflict resolution between supply chain members is critical.

## **2.6. SME and Supply Chain Management**

Supply chain management is a complex responsibility. There are supply chains within supply chain. Supply chains are not linear from one customer to one supplier. They involve multiple customers and multiple suppliers each of whom has a supply chain. Compound that with presence of three different supply chains-product, information and financial. This conundrum applies to companies regardless of size, regardless of industry and regardless of what country the businesses are located. It is especially difficult for Small-Medium Enterprises (SMEs). These firms fight a competitive battle against large companies who have leverage and resource advantages. Less-than-outstanding supply chain management only compounds the problems for these small-medium companies. It applies to SMEs regardless of their industries, markets or geographical locations (Craig, 2004).

A majority of the prevalent strategies in supply chain management continue to focus on large businesses. Fair enough. These companies, more often than not, have been the pioneers in embracing the concept of SCM. But what about the numerous small and medium enterprises? Has modern SCM been realistically successful in addressing the needs of SMEs? SMEs, due to their various constraints – finance, infrastructure, human resources among others — have found it tough to adapt modern SCM into their strategic ambience. SMEs often are not large enough to justify centralized organizations for supply chain management involving large corporate staffs in the various business functions. The result is a focus on individual facilities and, therefore, on a decentralized supply chain organization (The Financial Express, 2007).

SMEs often don't have personnel who have knowledge of sophisticated supply chain strategy and operations. Most of them recruit people with strong operational distribution and logistics skills rather than those with a broader supply chain perspective and experience. This result is a localized approach, with a focus on local efficiencies rather than on cross-enterprise opportunities. Consequently, SMEs can miss out on lower total corporate costs and higher overall efficiencies. And even as SMEs grow and expand their number of facilities, they often continue to focus on the individual plant/distribution centre instead of the entire corporation. To create a more centralized view, SMEs should construct an appropriate "to be" organizational chart with current positions, proposed positions and the timing, and criteria used to install the new roles (*ibid*).

In an increasingly international marketplace, many companies are finding that prosperity is best achieved from specialization, as opposed to diversification. While the majority of the world's largest companies continue to provide multiple services to numerous markets, they now purchase many components and goods from smaller companies that serve one particular niche. As the global marketplace continues to develop, SMEs provide an effective tool for economic growth through participation in global supply chains (GFP, 2005). However much supply chain management to date has focused on top-down enforcement management strategies, where an SME either complies or doesn't. This doesn't really help an SME much; it either loses the business, or is forced to make a heavy investment, which may impact adversely in the short term on its competitiveness and position in the marketplace. For a small company, this can be serious (Article 13, 2003).

## **2.7. Green Supply Chain**

Global warming, the greenhouse effect, natural disasters, disappearing rainforests, air and water pollution, overpopulation, pestilence and drought. Sounds like the makings of a summer movie blockbuster, but in fact the interest in environmentally friendly business practices has grown at such a rapid pace that the green movement has completely leapfrogged the it's just- a-fad stage and gone straight to the what's-our-eco-business-strategy-going-to-be? Stage (Blanchard, 2010).

The carbon emissions of a company's key supply chain partners in such areas as transportation and warehousing can contribute significantly to a product's overall carbon footprint. The same holds true for the sustainability practices of raw materials providers, contract manufacturers, and other contributors both domestic and global to the end product. "Greener products are generally more durable, and their use in your business will lead to fewer losses from damage or returns from customers," "Efforts to source your purchasing from companies that use innovative materials can dramatically reduce the amounts of hazardous or toxic chemicals that your company must handle or dispose of. This can, in turn, reduce insurance rates, disposal and treatment expenses, and legal liability while simultaneously increasing customer satisfaction and employee health and safety" (*ibid*).

## **3.0 METHODOLOGY**

### **3.1. Research Design**

This study employed descriptive research design modeled on case study. Descriptive research is concerned with measuring a variable or set of variables and describing them as they exist naturally answering the questions who, what, which, when, where or how much (Cooper & Schindler, 2001), making it more informative through structured questionnaires. The measurement and description of the variables was carried out both qualitatively and quantitatively to find out the state of supply chain management practices within SMEs in Ghana. Yin (2009) argued that when a research problem is of contemporary nature with little or no control and requires extensive in-depth description of a social phenomenon, case study could be the relevant research methodology. However the strengths and limitations of case study should be taken into consideration. The study also applied descriptive survey. In the survey, information is gathered at one point in time; survey research is sometimes referred to



as a status of normative study (Kothari, 2004). Survey method was used because it allows a large amount of data from sizeable population in economical manner and it uses instruments such as interviews and questionnaires mostly, hence standardization of data which allows easy comparison. The method is easily understood and the researcher has more control over the research process (Mugenda, 2003).

### **3.2. Sources of Data**

To assess the state of the supply chain management practices within SME's in Ghana, data were collected from both primary and secondary sources. The purpose of data collection is to pass information on to others, to obtain information to keep on record, and to analyze the collected data and obtain results that help to take decisions about important issues. To obtain results the study depended mainly on primary data while secondary data was used to give a background about the study area.

Structured questionnaire and personal interview were used to solicit information from respondents. This method was adopted to enable respondents to answer the questions at their will. The structured interview was carried out with the management, the distributors (wholesalers and retailers) and the farmers who in one way or the other are concerned with agro chemicals, either in terms of its production, distribution or usage.

Primary data was collected using structured questionnaires which were filled through personal interviews with the respondents. The questionnaire used in the study covered two hundred (200) distributors of Agrochemical products, thirty (30) farmers and thirty (30) management staff (Supply Chain Manager) of Agrochemical Companies

Secondary data is usually cheap and easy to collect, but must be treated with caution. For the study purpose, secondary data was collected from Agrochemical Companies in the Kumasi Metropolis. The secondary data aided in the mapping up of the supply chain in the Agrochemical Companies. The secondary data used also included information collected from the journals, magazines, written materials such as books and the Internet.

### **3.3. Population of the Study**

In an empirical research, it is necessary that the targeted population is clearly defined. According to Cox (2010), a target population for a survey is the entire set of units for which the survey data are to be used to make inferences. To be able to clearly define the target population, the researcher must identify all the specific qualities that are common to all the people or objects in focus. In addition, it is also imperative to define the accessible population considering the researcher's time, budget and workforce. This process will help the researchers grasp a concrete idea pertaining to the sample that they can obtain from the population. If the researcher has plenty of time, funds and workforce, he can opt to conduct the study using a completely randomized sample but if the time, money and workforce are limited, the researcher can opt to use convenience sampling or other forms of purposive

sampling. But still, the type of population sampling must depend on the research question and design. With respect to this study, the targeted population includes all entities in the supply chain of Agrochemicals companies in the Kumasi Metropolis. The population is made up of the suppliers, management body (Supply Chain or the Production Management), the distributors (wholesalers and retailers) and consumers (farmers) of Agrochemicals companied in the Kumasi Metropolis.

### **3.4. Sample and Sample Size**

Researchers usually cannot make direct observations of every individual in the population they are studying. Instead, they collect data from a subset of individuals called the sample and use those observations to make inferences about the entire population. Ideally, the sample corresponds to the population on the characteristic(s) of interest. In that case, the researcher's conclusions from the sample are probably applicable to the entire population. This type of correspondence between the sample and the larger population is most important when a researcher wants to know what proportion of the population has a certain characteristic like a particular opinion or a demographic feature.

The use of appropriate sampling methods and an adequate response rate are necessary for a representative sample, but not sufficient. In addition, the sample size must be evaluated. All other things being equal, smaller samples (e.g., those with fewer than 1,000 respondents) have greater sampling error than larger samples.

The sample size for the study included twenty (20) management staff, two hundred (200) distributors (wholesalers and retailers of Agrochemicals) and thirty (30) consumers involved in the agrochemical supply chain.

#### **3.4.5 Sampling Technique**

In any study, the research question determines the study method, but it is the research question and method together that define the sampling plan, the type of sample used, and the number of people who will make up the study sample. Other factors that affect decisions about sample sizes and sampling plans include time, money, access to subjects, and the number of study variables. Sampling is done usually because it is impossible to test every single individual in the population. If testing all the individuals is impossible, that is the only time we rely on sampling techniques. The study adopted convenience sampling as a technique for obtaining the appropriate data on both the management staff and the farmers. This technique was adopted to save time and money. However, two hundred and fifty (250) questionnaires were given out to the various distributors Agrochemical products throughout the Kumasi Metropolis but only two hundred (200) could be retrieved. This therefore gave a high response rate of 80.0%.

### **3.6. Data Collection Instruments**

The researcher used structured questionnaire and personal interview to solicit information from respondents (both qualitative and quantitative data) for the study. Additional interview sessions were held between the researcher and the management. Some minor observations were also used together with the interview and the questionnaire. Different questionnaires for these different bodies were developed to include both open-ended and closed-ended questions with the desire to capture the various objectives of the study. In addition, for receiving information about the specified case or target organization, a social survey was conducted. A social survey can be defined as “a technique for gathering statistical information about attributes, attitudes or actions of a population by administering standardized questions to some or all of its members” (Buckingham and Saunders, 2004:13). Secondary data for the study was also collected from the Internet and appropriate books.

### **3.7. Method of Data Analysis**

According to Saunders, *et al* (2007), the validity and understanding that you will gain from your data has more to do with data collection and analysis than with the size of your sample. Based on the nature of data collected, the statistical package for social science (SPSS) was used in processing primary data gathered from the selected respondents. Descriptive statistical elements including frequency tables, charts, and graphs were used to show some of the results from fieldwork. The compilation, editing and computation of the responses from the questionnaire for management; and customers enabled the researcher to comment objectively on the outcome. This proved crucial in making appropriate and objective recommendations by the researcher on the findings.

## **4.0 ANALYSIS AND DISCUSSIONS**

We have entered a new era in understanding the dynamics of competitive advantage and the role played by procurement. We no longer talk about suppliers and customers as though they are managed in isolation, each treated as an independent entity. More and more, we are witnessing a transformation in which suppliers and customers are inextricably linked throughout the entire sequence of events that bring raw material from its source of supply, through different value-adding activities to the ultimate customer. Success is no longer measured by a single transaction; competition is, in many instances, evaluated as a network of co-operating companies competing with other firms along the entire supply chain.

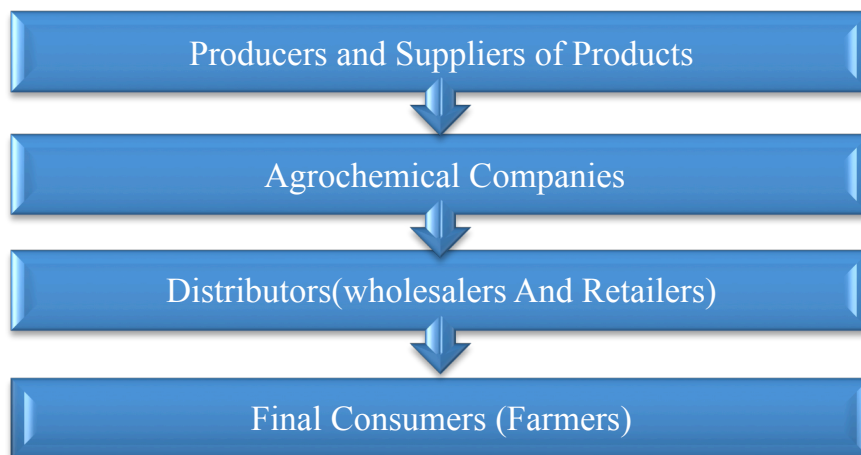
This new view of the world is echoed by Porter (1985), who advocates that the coordination of complex global networks of company activities is becoming a prime source of competitive advantage. The secret is to achieve breakthrough changes and improvements so that the expertise of members of the value-added network is shared throughout the system. The main suppliers, distributors and many others all participate in the customer satisfaction delivery process as design partners, risk-sharers, and engines of greater efficiency. These attempts at integrating this value-added network to achieve both customer value and competitive advantage are referred to as supply chain management.

This section looks at the various objectives of the study with respect to the primary data collected from the field. This chapter concentrates on the actual research findings and discusses data from the management staff, distributors and customers of Agrochemical companies, a renowned agrochemical producer and supply in the Ashanti Region. The analysis of data gathered from the field was made possible with the aid of research instruments such as questionnaires and an interview guide. This was designed purposefully to elicit information to investigate the state of the supply chain management practices within SME's in Ghana. Each case is examined and discussed individually. The outputs are presented in the form of tables and charts.

#### **4.1. The Supply Chain of Agrochemical companies s**

Supply chain is a network (group) of entities (members), formed to solve common logistics problems. It is about managing coordinated information, material, and financial flows, plant operations, and logistics. A distinguishing feature of supply chain from the traditional vertically integrated firms is that the former is organized on the fundamental premises of synchronization among multiple autonomous entities represented in it. That is improved co-ordination within and between various supply chain members is achieved inside the framework of mutually agreed to commitment made by members to each other. The framework below shown by figure 4.1 clearly map up the supply chain of Agrochemical companies.

**Figure: 4.1 The Supply Chain of Agrochemical companies**



**Source: Author's survey, 2015**

From the figure above, it can be said that Agrochemical companies receives several raw materials and many of its products from both domestic and foreign producers and suppliers. Majority of these foreign supplies come from Agrochemical firms in China. However, many

of these supplies are also obtained domestically as elaborated by the numerous domestic suppliers in the profile section of chapter three.

Logistically, the various operations and practices of Agrochemical companies are envisaged in its mission and visions. On the bases of its mission and vision, it had the desire to provide technology driven agro input marketing committed to the provision of quality, innovative, competitive customer focused service provider tailored to meet peculiar needs and by team of professionals, conscious of environmental safety management.

About 1000 wholesalers and retailers throughout the country distribute the various products of agrochemical companies. The structure and the spread of the distributors of Agrochemical companies are clearly elaborated by the profile in chapter three.

At the final end of the supply chain is the various farmers throughout the country. It should also be emphasized that information flows downwards from suppliers of Agrochemical companies to the firm and onwards to the various distributors who also convey this information to the final consumers (farmers). The final consumers also convey a feedback that also moves upwards till it finally reaches the suppliers of Agrochemical companies.

#### **4.2. Extent of Practice of Supply Chain Management in the Operations of Agrochemical companies s**

This part of the findings explains the extent to which SCM is practiced at agrochemical Companies as given below:

**Table: 4.1 Management staff's responses to the extent of SCM practices**

<b>Variables</b>	<b>Excellent</b>	<b>Very Good</b>	<b>Good</b>	<b>Indifferent</b>	<b>Poor</b>	<b>Very Poor</b>
Inventory Management	0%(0)	15%(3)	20%(4)	15%(3)	50%(10)	0%(0)
Logistics Management	5%(1)	45%(9)	50%(10)	0%(0)	0%(0)	0%(0)
Procurement Management	0%(0)	5%(1)	40%(8)	10%(2)	45%(9)	0%(0)
Distribution Management	0%(0)	15%(3)	35%(7)	10%(2)	40%(8)	0%(0)
Information Flow Facility Structure	0%(0)	15%(3)	35%(7)	5%(1)	45%(9)	0%(0)

**Source: Author's survey, 2015**

From Table 4.2, it was recorded that out of the 20 sampled management staff, 15% believed the practice of inventory management by the company was very good; 20% held it was good;

15% were indifferent with as much as 50% stating the respective practice as poor. On the practice of logistics management, 5% described the practice to be excellent; 45% saw it to be very good, with 50% describing it as good. The practice of procurement management had 5% describing it to be very good; 40% as good, 10% were indifferent and 45% as poor. Touching on distribution management, 15% believed it was very good; 35% characterized it as good; 10% of the sample was indifferent on the practice as 40% saw the respective practice to be poor. Finally on information flow facility structure of the company, 15% held it was very good; 35% terming it as good; 5% was indifferent and 45% believed it was poor.

From the analysis, it can thus be said that Agrochemical companies is not highly engaged in the practices of supply chain management. Aside the practice of logistics management which depicted a favourable outcome, all the others were not practiced effectively as reflected in the management staffs appraisal.

#### 4.2.1. Distributors Responses to the Extent of SCM Practices

This portion of the research presents responses by distributors of Agrochemicals' products on the extent of related and SCM practices.

**Table: 4.2. The extent of the firm's application of the following practices (Distributors)**

Item Description	Very High	High	Not At All	Little	Very Little
Tight Linkages Between Customers And Suppliers	12%(24)	10%(20)	8%(16)	70%(140)	0%(0)
Purchase Order Information Tracking	10%(20)	17%(34)	7%(14)	66%(132)	0%(0)
Quality And Delivery Tracking	13%(26)	24%(48)	4%(8)	44%(88)	15%(30)
Supplier/Customer Satisfaction Measures	15%(30)	24%(48)	5%(10)	56%(112)	0%(0)
Finished Goods Visibility	18%(36)	50%(100)	7%(14)	25%(50)	0%(0)
Order Entry And Order-Taking Technology	45%(90)	65%(110)	0%(0)	0%(0)	0%(0)
Individual Customers Managed As Accounts	13%(26)	23%(46)	19%(38)	45%(90)	0%(0)
Process Control	0%(0)	18%(36)	3%(6)	46%(92)	33%(66)
Integrated Quality Information	0%(0)	10%(20)	18%(36)	60%(120)	12%(24)
Electronic Data Interchange (EDI) Customer Links	13%(26)	19%(38)	12%(24)	52%(104)	0%(0)

**Source: Author's survey, 2015**

From table 4.3, out of two hundred (200) distributors, the majority constituting about 70.0 % of the total respondents believed the practice of tight linkages between customers and suppliers is little; 12% was of the view it was very high; 10% perceived it to be high and 8% believed it did not exist at all. On the assessment of purchased order information tracking,

10% respondents saw the practice to be very high; 17% believed it was high and 7% was of the view the practice did not exist at all. The remaining 66% that constituted the majority however believed the practice was little. Also, on the basis of quality and delivery tracking, 13% held it was very high; 24% saw it to be high; 4% believed it did not exist at all. However, the majority constituting 44% characterized the practice to be little with 15% terming it as very little in practice. Moreover, 15% believed the practice of supplier/customer satisfaction measure was very high; 24% saw it to be high whilst 5% held the practice did not exist at all. The majority constituting 56% however believed the practice is little. On the basis of visibility of finished goods, from the total respondents, 18% classified the practice as very high; 50% was of the view it was high; 7% believed it did not exist at all and 25% perceived the practice as little. Considering order entry and order-taking technology, 45% believed it was very high and as much as 65% perceived it to be high. In addition, on the basis of the practice of shipment tracking, 13% believed it was very high; 12% held it to be high and 23% perceived it did not exist at all. The majority constituting 52% however believed it was little. Furthermore, on the basis of managing individual customers account, 13% of the sampled distributors held the practice was very high; 23% categorized it to be high and 19% did not see the existence of the practice at all. However, the majority constituting 45% believed the practice was little. The practice of process control had 18% characterizing it as high; 3% believed the practice did not exist at all whilst 46% of the sample perceived the respective practice to be little. The remaining 33% however held the practice to be very little. Majority of distributors believed that the practice of integrated quality information was little as indicated by their response of 60%; 10% held the practice to be high; 18% was of the view it was not at all practiced whilst 12% perceived the practice as very little. In terms of the practice of electronic data interchange customer links, 13% of the sample believed the practice was very high; 19% held it to be high and 12% was of the view the practice did not exist at all. The majority constituting 52% of the sample however believed the practice was little.

It can therefore be said from table 4.3 that the extent of other related SCM practices at Agrochemical companies as viewed by the distributors of the company leaves a whole lot to be desire. This is deduced from the poor or little nature of key related practices like linkage between suppliers and customers, purchase order information, supplier-customer satisfaction measure, quality and delivery tracking, integrated quality information amongst others.

**Table: 4.3 Responses of distributors on distribution and inventory management SCM practices**

SCM Practices	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree
The distribution of goods are done very often	20.5%(41)	23.8%(48)	0%(0)	55.7%(111)	0%(0)
The goods are readily available at distribution centers	16.9%(35)	34.8%(70)	0%(0)	48.3%(97)	0%(0)
The warehouses are	9.0%(18)	27.9%(56)	0%(0)	63.1%(126)	0%(0)

able to keep much products and for very long					
In terms of inventory management, the firm is able to avoid over and under inventory	15.8%(32)	20.1%(40)	0%(0)	64.1%(128)	0%(0)
The capacity of transportation is able to handle products effectively	20.8%(42)	65.8%(131)	0%(0)	13.4%(27)	0%(0)
There is coordination among transportation	23.1%(46)	54.3%(109)	0%(0)	22.6%(45)	0%(0)

**Source: Author's survey, 2015**

Table 4.4 emphasizes the extent of the strength of Agrochemical companies in its distribution and inventory management practices. From the table, on the basis of the rate of distribution of goods, out of the 200 sampled respondents, 20.5% and 23.8% strongly agreed and agreed respectively. The remaining 55.7% constituting majority of the sampled respondents disagreed with the respective SCM practice. With regard to the readily availability of goods at the distribution centers, 16.9% and 34.8% strongly agreed and agreed respectively. However, the remaining 48.3% also representing the majority disagreed with the level of practice. Furthermore, considering the warehouse ability to keep many products and for very long, the majority of the respondents of distributors constituting about 63.1% disagreed. 9% and 27.9% of the distributor respondents also strongly agreed and agreed respectively to the statement. On the basis of the firm's inventory management's ability to avoid over and under inventory, 15.8%, 20.1% and 64.1% strongly agreed, agreed and disagreed respectively to the statement. On the assessment of the firms' transformational capacity to handle products effectively, majority of the respondents constituting 65.8% agreed to the statement. However, the remaining 20.8% and 13.4% respondents of distributors strongly agreed and disagreed respectively to the statement. Finally, in assessing the coordination among the transformational facilities of Agrochemical companies, 23.1% and 22.6% strongly agreed and disagreed respectively. However, the majority representing 54.3% agreed to the statement.

From the analysis, it can be seen that SCM practices on managing distribution and inventory by Agrochemical companies as perceived by distributors of the company's product leaves much to be desired. However, in specific areas of distribution like capacity of transportation to handle products effectively and coordination among transportation, the majority of the distributors agreed to Agrochemical companies encouraging performance.

#### **4.3. Customers Responses to the Practice of SCM**

This part of the findings presents the views of customers on their views of the practices of SCM by Agrochemical companies as given below:



**Table: 4.4 Customer's responses to the practice of SCM**

	Excellent	Very Good	Good	Indifferent	Poor	Very Poor
Information Dissemination	6.7%(2)	13.2%(4)	23.1%(7)	9.9%(3)	46.2%(14)	0%(0)
Price Level of Products	0%(0)	13.2%(4)	9.9%(3)	19.8%(6)	49.5%(15)	7.6%(2)
Prevention of Shortages of Products	0%(0)	13.2%(4)	13.2%(4)	16.5%(5)	46.2%(14)	9.9%(3)
Provision of Transportation	0%(0)	6.7%(2)	13.2%(4)	16.5%(5)	33.0%(10)	28.4%(9)
Provision of Storage Facilities	0%(0)	13.2%(4)	16.5%(5)	9.9%(3)	36.4%(11)	23.1%(7)

**Source: Author's survey, 2015**

The assessment of the customer is essential for the growth of the industry in its practice of SCM. These opinions of the customer are often given as a feedback for re-assessment of the practices so as to effect the necessary changes or adjustments.

From table 4.5, out of the thirty (30) sampled customer group (farmers), 6.7% believed that information dissemination within the chain was excellent whereas about 13.2% also believed it was very good. However, 23.1% believed it was good and 9.9% were indifferent. The remaining 46.2% constituting simple majority believed it was poor. In addition, on the basis of price level of products, the majority of the respondents constituting about 49.5% believed it was poor; 13.2% held it was good; 9.9% believed it was good whist 9.8% were indifferent; 7.6% however were of the opinion the price level of products were very poor. Similarly, prevention of shortages of products, 46.2% representing the simple majority believed the practice was poor; 13.2% held it was very good with another 13.2% of the sample believing it was good. However, 16.5% were indifferent on the subject whist 9.9% perceived the practice as very poor. On provision of transportation by the company, the customers 6.72% of the sample saw the practice as very good; 13.2% held it to be good with 16.5% remaining indifferent on the subject. As much as 33% were of the view the practice was poor with 28.4% further classifying it as very poor. Finally on the provision of storage facilities by Agrochemical companies, 13.2% of the sampled customers believed the practice was very good; 16.5% held it was good; 9.9% were indifferent on the subject; as much as 36.4% termed the practice as poor and 23.1% further classified it as very poor.

The opinions of the customers give an indication of weak practices of supply chain management practices within the supply chain of Agrochemical companies as analysed above and depicted in table 4.5

#### **4.4. Factors Inhibiting the Practices of Supply Chain Management in Agrochemical companies s**

Typically, SCM is driven by dynamic technological innovation, management skills across department and organizational functions, and integration vertically and horizontally across industry. These drivers can be considered driving forces. Although these drivers push for supply chain collaboration, barriers or resisting forces push back. Conceptually, strategic supply chains seem to succeed or fail on the degree of resource sharing among partners (e.g. information, knowledge, skills) and the partners' ability to use these resources effectively in changing environments.

In an interview conducted with the management body of Agrochemical companies. the production manager revealed several factors that inhibit its desire to promote a better SCM practices within the organization. These factors include loyalty and commitment levels within the chain, inadequacy of funds and technology, inadequate experienced personnel, infrastructural problems, competition, inadequate contribution towards research and development and many others.

##### **4.4.1. Loyalty and Commitment**

Effective supply chain management in the new competition suggests seeking close, long-term working relationships with one or two partners (both suppliers and customers) who depend on one another for much of their business; developing interactive relationships with partners who share information freely, work together when trying to solve common problems when designing new products, who jointly plan for the future, and who make their success interdependent. However, in a situation where information flow becomes difficult or where commitment to responsibility and duty become less, the process and practices of SCM will be inhibited as confronting Agrochemical companies s, the Production Manager made known. He hinted the major difficulty of information flow is often emanating from the farmers, and hence making it difficult to innovate to suit their preferences and therefore satisfaction levels.

##### **4.4.2. Inadequacy of Funds and Technology**

Agrochemical companies. is tremendously hindered by technological and capital inadequacy in its quest to reap the full benefits of SCM application in its environment of operations. Logistically, it is confronted with the problem of applying more capital intensive method because of its capital and technological incapability's as the production manager hinted.

##### **4.4.3. Inadequacy of Experienced Personnel**

For well and smooth running of SCM, all corporations need highly qualified and well trained personnel for the purpose. This would include personnel for the position of production, SC management, Logistics and many others. However, the size or capacity and financial

incapability of Agrochemical companies impedes its ability to hire the services of the right personnel to handle those responsibilities and duties.

#### 4.5. Reasons and Benefits to engage in Supply Chain Management (SCM)

This portion of the research presents diverse reasons why it is necessary to engage in SCM and some of the benefits derived by Agrochemical companies from the practice of SCM.

##### 4.5.1. Reasons to Engage in SCM

**Table: 4.5 Reasons to engage in supply chain management**

To What Extent Does The Firm Engage In Supply Chain Management?"	Very High	High	Not At All	Little	Very Little
Increased End-Customer Satisfaction	15%(3)	70%(14)	5%(1)	5%(1)	5%(1)
Improved Profits	25%(5)	75%(15)	0%(0)	0%(0)	0%(0)
Secure Reliable Source/Market For This Item	35%(9)	65%(13)	0%(0)	0%(0)	0%(0)
Satisfy Supplier/Customer Request	35%(9)	65%(13)	0%(0)	0%(0)	0%(0)
Reduce Overall Operating Costs	70%(14)	30%(6)	0%(0)	0%(0)	0%(0)
Gain Strategic Market Position	90%(18)	10%(2)	0%(0)	0%(0)	0%(0)
Reduce Lead Time	75%(15)	25%(5)	0%(0)	0%(0)	0%(0)
Price Paid For Item	70%(14)	30%(6)	0%(0)	0%(0)	0%(0)
Improved Productivity	90%(18)	10%(2)	0%(0)	0%(0)	0%(0)
Regulations And Tax Implications	20%(4)	40%(8)	40%(8)	0%(0)	0%(0)
Environmental	10%(2)	20%(4)	30%(6)	40%(8)	0%(0)
Reduce Product Development Costs	60%(12)	40%(8)	0%(0)	0%(0)	0%(0)

**Source: Author's survey, 2015**

To assess the reasons for management of Agrochemical companies desire to engage in supply chain management emphasis was given to several factors such as increased end-satisfaction, improved profits, secure reliable source/market for the its products, satisfy supplier/customer request and many others shown by table 4.6.

From the table, on the basis of the desire to engage in SCM motivated by increased end-customer satisfaction, out of the total respondents of 20 management staff, 15%, 70% and 5% believed it was 'very high', 'high' and 'not at all' respectively. However, 5% and 5% also believed it was 'little' and 'very little' respectively. On the basis of improved profits, 25% and 75% was of the view it was 'very high' and 'high' respectively. Also, on the basis of securing reliable source of market, 35% and 65% also believed it was 'very high' and 'high' respectively. With respect to the desire to reduce the overall operating cost, 70% held it was 'very high' whereas the remaining 30% believed it was 'high'. Moreover, on the basis of gaining strategic market position, 90% believed it was 'very high' and the remaining 10% as well were of the opinion it was 'high'. Similarly, on the basis of reducing lead time, the majority constituting 75% believed it was 'very high' and the remaining 25% however held it

was ‘high’. In addition, on the basis of reducing prices paid for items, the majority of 70% believed it was ‘very high’ whereas the minority of sampled staff representing 30% believed it ‘was high’.

To further elaborate on the reasons or the desire for the Agrochemical companies to engage in SCM, 90% believed the emphasis given to the improvement of productivity was ‘very high’ where as the remaining 10% were of the view it was ‘high’. Based on the achievement of better regulations and tax implications, 20%, 40% and 40% believed it was ‘very high’, ‘high’ and ‘not at all’ respectively. On the emphasis of the desire to mitigate environmental problems, 10% and 20% believed it was ‘very high’ and ‘high’ respectively. The remaining 30% and 40% believed it was ‘not at all’ and ‘little’ respectively. This clearly indicates that their major emphasis in the desire to employ a sustainable SCM is not to mitigate environmental problems. Finally, on the basis of the desire to reduce product development cost, 60% believed it was ‘very high’ whereas the remaining 40% believed it was ‘high’.

From the analysis, it can be said that practicing SCM is of great essence to the effective operations of Agrochemical companies in the industry.

#### 4.5.2. Benefits of SCM to Agrochemical companies.

Before investing money, time, and other resources into difficult implementations, most managers want to know if the results are worth the effort. Identifying and quantifying the expected benefits is a critical part of any cost/benefit analysis. Therefore the assessment of the benefits that could possibly accrue from SCM is imperative.

An effective, realistic, and flexible SCM system can have significant benefits for any business. First, it can make it easier to manage all of the different factors that contribute to the purchasing and production cycle. Additionally, the SCM system reduces the chances of human error. Efficient SCM systems also lead to greater productivity, lower costs, and reduced inventory. Additionally, a fine-tuned SCM system delivers better communication, shorter planning times, and more reliable forecasting. The amalgamation of all of these benefits is a balance between keeping costs reasonable and maintaining production levels. This is definitely worth the effort and delivers value to businesses.

**Table: 4.6 Benefits of SCM to Agrochemical Companies**

<b>Variables rated in terms of benefits to Agrochemical companies</b>	<b>Very much</b>	<b>Much</b>	<b>Not at all</b>	<b>Little</b>	<b>Very little</b>
Increased end-customer satisfaction	90%(18)	10%(2)	0%(0)	0%(0)	0%(0)
Improved profits	90%(18)	10%(2)	0%(0)	0%(0)	0%(0)
Secure reliable source/market for this item	85%(17)	15%(13)	0%(0)	0%(0)	0%(0)
Satisfy supplier/customer request	70%(14)	30%(6)	0%(0)	0%(0)	0%(0)
Reduce overall operating costs	90%(18)	10%(2)	0%(0)	0%(0)	0%(0)
Gain strategic market position	95%(19)	5%(1)	0%(0)	0%(0)	0%(0)

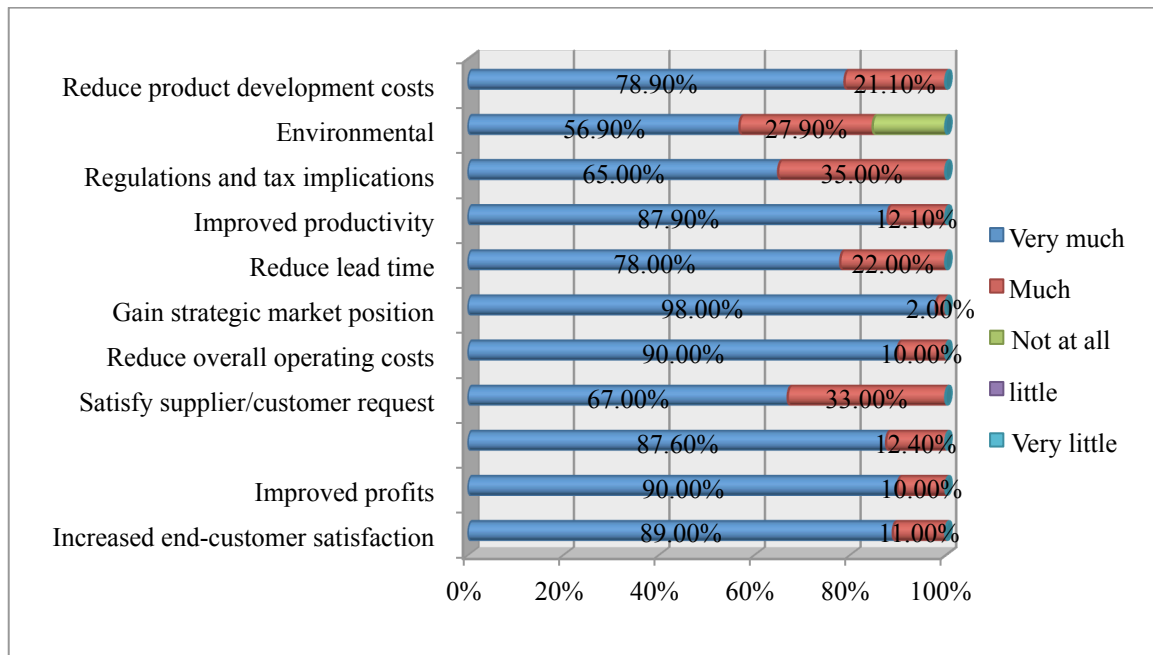
Reduce lead time	80%(16)	20%(4)	0%(0)	0%(0)	0%(0)
Improved productivity	85%(17)	15%(3)	0%(0)	0%(0)	0%(0)
Regulations and tax implications	65%(13)	35%(7)	0%(0)	0%(0)	0%(0)
Environmental	60%(12)	25%(5)	15%(3)	0%(0)	0%(0)
Reduce product development costs	80%(16)	20%(4)	0%(0)	0%(0)	0%(0)

**Source: Author's survey, 2016**

Agrochemical companies desire to achieve certain number of benefits propelled them to put much into the management of its supply chain. These benefits derived included increase end-customer satisfaction, improved profits, secure reliable source of market, reduce overall operating cost, gain strategic market position, reduced lead time and many others shown by table 4.7.

From table 4.7, on the basis of achieving the benefit of increased end-customer satisfaction, out of the twenty (20) respondents (management staff), 90% believed 'very much' benefit was derived whereas the remaining 10% perceived it to be 'much'. Moreover, on the basis of improved profits, 90% believed the derived benefit was 'very much' whereas the remaining 10% however was of the view it was 'much'. With respect to securing reliable source of market, 85% and 15% believed the derived benefit was 'very much' and 'much' respectively. Similarly, in terms of the desire to satisfy supplier-customer request, 70% believed the benefit derived was 'very much' whereas the remaining 30% believed it was 'much'. Furthermore, on reduction in the overall operating cost, majority of the respondents constituting 90% believed the derived benefit was 'very much' and the remaining 10% believed it was 'much'. On the basis of gaining strategic market position in the agrochemical industry, an enormous majority of 95% believed the derived benefit was 'very much' whereas the remaining 5% perceived it to be 'much'. On reducing lead time, 80% and 20% believed the benefit was 'very much' and 'much' respectively. In furtherance of the discussions above and on the basis of achieving improved productivity, 85% believed it was 'very much'. However, the remaining 15% believed it was just 'much'. For the purposes of regulations and tax implications, the simple majority constituting 65% believed it was 'very much' and the remaining 35% believed it was 'much'. On the basis of achieving some level of reduction in environmental degradation, 60% believed benefit in this regard was 'very much'. However, 25% believed it was 'much'. Finally, the agrochemical firm in its achievement of reduced product development cost, 80% believed associated benefit was 'very much' whereas the remaining 20% believed it was rather 'much'. The phenomenon described above is also shown pictorially by fi

**Figure: 4.2. Benefits of SCM to Agrochemical Companies**



Source: Author's Survey, 2015

## 5.0 CONCLUSION

The study sought to map up the supply chain of agrochemical companies, find out the extent of practice of SCM in their operations, discover the factors inhibiting the practice of SCM in agrochemical companies and to identify the benefits that would accrue to agrochemical companies in practicing SCM. The discussion of the results in the previous chapter shows the following main findings.

### 5.1. Supply chain of agrochemical companies

The supply chain of agrochemical companies begins from producers and suppliers of products (foreign and domestic sources) to agrochemical companies onwards to its distributors (wholesalers and retailers) then to the final consumers (farmers). There is often a downward information flow from the producers and suppliers of products to agrochemical companies down to its consumers. This information as well flow from consumers in the form of feedback through the distributors onwards to agrochemical companies then to the producers and suppliers of the respective products.

#### 5.1.2. Practices of supply chain management by agrochemical companies.

Agrochemical companies in Kumasi are not highly engaged in the practices of supply chain management though attempts are being made by management staff to practice such. Aside the practice of logistics management which was practiced effectively, others which included inventory management, procurement and distribution management though practiced by the companies was not effectively carried out as revealed by the management staff.

Distributors' assessment of the extent of other related SCM practices by agrochemical companies leaves a whole lot to be desired. This was revealed from the study as key related practices like linkage between suppliers and customers, purchase order information, supplier-customer satisfaction measure, quality and delivery tracking, integrated quality information amongst others were found to be poor or little. Also, the practices of distribution and inventory management by agrochemical companies were perceived by its distributors as not being effectively carried out. However specific areas of distribution like capacity of transportation to handle products effectively and coordination among transportation was held by them as encouraging. The responses of the customers (farmers) on the other hand gave an indication of weak practices of supply chain management practices within the supply chain of agrochemical companies.

### **5.1.3. Factors inhibiting the practice of SCM**

The study revealed the factors inhibiting supply chain management practices of agrochemical companies to include loyalty and commitment levels within the chain, inadequacy of funds and technology, inadequate experienced personnel, infrastructural problems, competition, inadequate contribution towards research and development and many others. These can be linked to the cause of the weak SCM practices facing the companies.

### **5.1.4. Benefits of SCM to Agrochemical Companies**

The achieved benefits of SCM to agrochemical companies includes increased end-customer satisfaction, improved profits, secure reliable source/market for its items, satisfy supplier/customer request, reduced overall operating costs, gain strategic market position, reduce lead time, improved productivity, better regulations and tax implications and reduced product development costs.

## **5.2. Conclusion**

In the 1980s, the term Supply Chain Management (SCM) was developed to express the need to integrate the key business processes, from end user through original suppliers. Original suppliers being those that provide products, services and information that add value for customers and other stakeholders. The basic idea behind the SCM is that companies and corporations involve themselves in a supply chain by exchanging information regarding market fluctuations and production capabilities.

If all relevant information is accessible to any relevant company, every company in the supply chain has the possibility to and can seek to help optimizing the entire supply chain rather than sub optimize based on a local interest. This will lead to better planned overall production and distribution which can cut costs and give a more attractive final product leading to better sales and better overall results for the companies involved.

Incorporating SCM successfully leads to a new kind of competition on the global market where competition is no longer of the company versus company form but rather takes on a supply chain versus supply chain form.

The primary objective of supply chain management is to fulfill customer demands through the most efficient use of resources, including distribution capacity, inventory and labor. In theory, a supply chain seeks to match demand with supply and do so with the minimal inventory. Various aspects of optimizing the supply chain include liaising with suppliers to eliminate bottlenecks; sourcing strategically to strike a balance between lowest material cost and transportation, implementing JIT (Just In Time) techniques to optimize manufacturing flow; maintaining the right mix and location of factories and warehouses to serve customer markets, and using location/allocation, vehicle routing analysis, dynamic programming and, of course, traditional logistics optimization to maximize the efficiency of the distribution side.

However, the study discovered several hindrances to the smooth running of SCM and its associated benefits. They included loyalty and commitment that often impedes information flow, inadequacy of funds and technology and inadequacy of experienced personnel.

### **5.3. Recommendations**

#### **5.3.1. Gain an understanding of the marketplace**

An understanding of the business environment is needed in order to determine where the supply chain management strategy can be applied to best effect. Identify the market characteristics of each product or service. Consideration must be given to areas like customer needs, pressures from suppliers and the level of competitor activity. Carry out a SWOT analysis (Strengths/Weaknesses/Opportunities/Threats) and look at your current position. Consider what other organisations are doing to compete on quality, service, delivery and value.

#### **5.3.2. Analyse the business critically**

Summarise and review the existing core competences of the organisation. What business are you in? Which operations are core to the operation and which could be outsourced? Combine the information on customer needs and strategic priorities to identify key business areas where an integrated supply chain management can have a benefit. Analyse where you sit within the supply chain. Who are your suppliers and customers? Do you have good relationships with them? What level of cooperation currently exists?

#### **5.3.3. Analyse the existing supplier base**



Produce a list of the suppliers for each product area. Evaluate them against a set of performance criteria. These might include price, reliability, responsiveness, delivery arrangements, use of quality systems, and product specification. Examine the number of suppliers you need. Having too many suppliers increases both the management task of controlling them and the associated administrative costs. Reducing the total and moving towards single-sourcing can produce such benefits as lower administration costs, more time to manage each supplier, an improvement in the relationship between you and the supplier, more responsive problem solving, resulting from a greater understanding of difficulties and requirements and better communication.

#### **5.3.4. Categorization of suppliers**

The use of some criteria, such as underperforming, preferred and strategic would help reduce the overall total. Look to working with each category to bring cost reductions to your business and to the supply chain. Those that are underperforming are likely to bring few improvement ideas to the supply chain. Each represents a cost in terms of negotiation time and servicing. A substantial reduction in their number will free up time to spend on more productive supplier activities. Enter into negotiations with preferred suppliers to explore the potential to reduce inventory, distribution, handling, and warehousing costs. Cost transfers may be negotiable in return for commitments to longer-term supply.

#### **5.3.5. Partnership**

Partnerships are the natural next level in the evolution of the supply chain. Partnerships allow organisations to work together to take advantage of market opportunities and to respond to customer needs more effectively than they could in isolation. Partnering would mean sharing risk with others and trusting them to act in joint best interests. There should be a strategic 'fit' between partners so that objectives match and action plans show synergy, finding complementary skills, competences and resources in partners, sharing information which may have been privileged or confidential and involving suppliers at the earliest stages of design of a new product. The firm can start with one particular supplier with whom they already have a good relationship or an emerging, forward-looking supplier. Gaining real commitment from all members of the supply chain means that total costs can be kept to a minimum to the benefit of everyone. Allow plenty of time for a win/win scenario to emerge. Trust takes time to develop and can be quickly lost. Each organisation is responsible primarily for its own survival however and cannot always put the needs of others before its own.

### **5.3.6. The need to monitor the chain**

Setting up a supply chain is only the first step. Ensuring that it operates as planned and delivers the benefits to all parties is a critical ongoing activity. The firm must ensure that appropriate measures and indicators are analysed on a regular basis to ensure that everything is working to plan, so that any shortcomings can be quickly identified and action taken if necessary. For example, delivery delays could be due to short-term problems, such as a strike at a port, or due to a potentially serious longer-term problem, such as materials shortages. Performance indicators should help quantify the benefits of the chain in terms of reduced costs, reduced delivery times, improved quality, reduced administration and, above all, improved customer satisfaction.

### **5.3.7. Faulty logic behind SCM must be addressed**

Managers first need to address the faulty logic, which has guided many SCM decisions. Some examples of this bad logic include the ideas that lead times will never change, that suppliers' capacities are endless, and that queues must be a part of the process. None of these things are true, but most managers believe them and those ideas are reflected in the SCM system. The truth is that lead times are extremely variable and depend on both parties. First, if the buyer is not providing a prompt and reliable stream of information to the supplier, then the vendor is not going to be able to produce the necessary goods in a prompt and reliable fashion. Furthermore, suppliers do have other companies that they work with. The fact is that the larger, more profitable project is going to get first attention even if that has a negative effect on one buyer's lead times. When a SCM system isn't flexible enough to deal with these problems, then it can prevent the buyer from gaining the competitive advantage in the market that the system was designed to secure.

### **5.3.8. Measures to overcome some of the barriers**

Strategic supply chain partners can create and implement initiatives that bridge the gap between a supply chain and a strategic supply chain. Some of these bridges include people empowerment, information integration, and alliance design. Thus, strategic supply chains can create value contingent on their ability to overcome resisting forces through various mechanisms.

### **5.3.9. Limitation of the Study**

As a result of time and financial constraints, it was impossible to conduct the study across all SME's in the country but through appropriate research methodology, data obtained from the study area was a reflection of all SME's in the country.

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